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# AGRICULTURAL NEWS LETTER

VOL. 6 - NO. 4 APRIL, 1938

This publication gives information on new developments of interest to agriculture on laboratory and field investigations of the du Pont Company and its subsidiary companies.

In addition to reporting results of the investigations of the Company and its subsidiaries, published reports and direct contributions of investigators of agricultural experiment stations and other institutions are given dealing with the Company's products and other subjects of agricultural interest.

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# EMPHASIS PUT ON FARM CONDITIONS IN RELATION TO WILDLIFE AT BALTIMORE CONFERENCE OF AMERICAN WILDLIFE INSTITUTE

EDITOR'S NOTE:- Highlights of an important gathering of wildlife authorities, with particular reference to the part agriculture has in conservation and restoration, are given in this article.

By William McCormick, Publicity Director,
American Wildlife Institute,
Investment Building,
Washington, D. C.

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Developing promise of more concrete results than any similar assemblage of authorities, the Third Annual North American Wildlife Conference, held in Baltimore, Maryland, is pointed to as the most significant conclave of its kind yet convened. It was sponsored and managed by the American Wildlife Institute.

There was presented every evidence that the country today is becoming increasingly conscious of the importance of preserving and restoring American wildlife.

Many problems that had evoked storms of controversy in the past were brought up in open forums and discussed from various angles in an effort to clarify points of contention. While, in some instances, complete agreement was not reached by authorities taking divergent views, a better understanding was reached. Such understanding cannot but prove of benefit in securing greater cooperation and unison of purpose in future wildlife restoration activities, it was agreed.

## Technical Sessions Proved Important

In the technical sessions, leading authorities on wildlife management read scientific papers disclosing the latest developments in the field of research. The dissemination of the findings will make available to all interested, modern and exact methods for restoring wildlife.

One of the significant discussions on a disputed point centered around the mosquito control problem. Certain Federal Government authorities responsible for the protection of wildlife have maintained that needless drainage had, in some instances, been carried on in the name of mosquito control. They admitted the necessity for control under some conditions, but asked for the elimination of useless drainage, often the cause of even more mosquitos. Those charged with protecting the public health, of course, have maintained that no such condition has existed. The problem is considered as one of particular concern to farmers because mosquito control drainage has, in many cases, deprived farmers of a source of income from the taking of muskrats.

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While no complete agreement was reached on this highly controversial subject, the airing of the several angles of the problem served to awaken general interest in a question that had been little impressed on the public mind in the past. It is believed that the way has been opened to closer cooperation between the advocates of extensive drainage and those seeking to preserve wildlife that depends upon swampy areas for its existence.

## Stream Pollution Discussed

Similarly, frank discussion of the stream pollution problem, no doubt, will lead to a greater degree of cooperation and more consultation on the part of those holding different views on the subject before steps are taken that might damage national outdoor resources.

Dr. William Ellis, of the United States Bureau of Fisheries, declared the first interest of the country should now be the preservation of unpolluted streams, while the second interest should be the return to normal of polluted waters. He claimed that many industries today were seeking to dump wastes into waters as yet uncontaminated. He warned, however, against stringent measures which would "prevent industries from using all public waters." He said, "Such an act would be against the mass of public opinion."

Those giving industry's views in the matter urged more exhaustive study of the subject and pledged all possible assistance in the prevention of pollution.

Among other problems discussed by authorities in open forum were those having to do with planning for adequate wildlife management, public apathy, the necessity for wildlife research as a practical basis for management, the status of wildlife as a factor in drainage and reclamation planning, the maintenance of annual fish crops, the development of inland waters, and waterfowl and waterfowl regulations.

## Conditions Affecting Wildlife on Farms

At the technical sessions, Frank C. Edminster, United States Soil Conservation Service, read a highly significant paper on the value of the farm fence in relation to wildlife.

"Open land in farm crops or pasture is, in itself, generally inferior habitat for the majority of the wildlife species of the northeast," said Mr. Edminster. "This is particularly true with sedentary forms, including all farm birds. While species such as the meadowlark or field sparrow may find all their requirements within a single field, most birds, and the larger mammals, need a diversification of cover types in their all-year-round territory. Varieties of crops grown on a farm provided some important changes in their habitat and their margins are edges of a sort, especially when strip-cropped. But, by and large, farm fields lack year-round shelter and are not secure in the major habitat attributes. Moving, harvesting, grazing and plowing will at one time or another cut off most of the livelihood of the wildlife inhabitants.

"Woody vegetation of one type or another, swales and swamps are the major types of permanent shelters found on farms in the northeast. Properly distributed through farmed lands, they greatly enhance the carrying capacity of most forms of farm wildlife. However, with the emphasis given to 'clean' farming and the

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utilization of all possible acres for crops, these shelter areas are usually confined to land not farmable because of physiographic conditions and are generally not well distributed. Or, we may say, crop lands are generally in contiguous fields resulting in extensive acres devoid of adequate cover. This condition reaches its highest development on the more fertile and high-value land-value farms and is generally progressively less true on farms which approach the submarginal class.

## Need for Education Seen

"The problem is largely one of education," Mr. Edminster continued." When it becomes stylish to have a dogwood hedge instead of a bare wire fence, then it will be done. It must be considered good farming practice to allow fences to overgrow. A man must be judged a good farmer when he does so. When shown the correct economics of brushy fences, it should not be difficult to change the aesthetic viewpoint. A fence of leaves, flowers, fruit, is certainly of more landscape value than a stretch of galvanized wire. Other nations have learned their worth; it is time that America awoke to an appreciation of the value of a beautiful farm landscape. Grange and McAtee note that 'The famed English countryside owes its beauty and general attractiveness largely to growths of vegetation between fields, so useful in breaking the monotony of crop lands.'

"I have indicated in a general way that the presence or absence of overgrown fences determines to a considerable extent the wildlife population of the farm. Obviously this is true only in proportion to the extent and distribution of other permanent wildlife shelter habitat. The need for emphasis on brushy fences, as far as wildlife is concerned, is primarily on farm lands which lack an adequate system of woods, swales and swamp lands.

"The relation of many species of wildlife to shrubby field boundaries may be illustrated by the case of the pheasant. While winter food is probably the dominant limiting factor of this species, the extent of the hedgerows is also of major importance.

"Many square miles were studied, covering the difference between 'clean' farms and those where there was a variation of overgrown fencerows. The average pheasant population per square mile on the first numbered twenty-one, while on the latter it numbered fifty-one."

## More Than One Paper Presented

A total of more than one hundred papers were presented during the technical sessions of the conference, which ran concurrently with the open forum discussions.

Four days of the conference were given over entirely to the affairs of the General Wildlife Federation, an all-embracing organization banding together many clubs and individuals interested in wildlife restoration and conservation.

During Federation Day, plans were completed for National Wildlife Restoration Week, a major project of the Federation, which started March 20.

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As an indication of the nation-wide interest displayed in the conference, every major press organization sent staff correspondents to cover the proceedings. In addition, all the national outdoor magazines and many of the magazines of general interest were represented, along with important newspapers.

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## BENEFITS FROM COTTON SEED TREATMENT WITH MERCURY DUST DEMONSTRATED BY RESULTS IN SOUTH CAROLINA AND GEORGIA

EDITOR'S NOTE:- Those interested in obtaining further information on experimental and other work in connection with seed treatment may secure it by addressing their requests to the editor of this publication.

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A one and one-half million dollar increase in the state's 1937 cotton crop by seed treatment for only 250,000 acres points the way to still greater results in 1938 and the future, according to W. C. Nettles, extension entomologist, Clemson College, Clemson, South Carolina. A statement issued by the college reads: "One acre out of every six, or 250,000 acres, planted to cotton in South Carolina during 1937 was planted in seed treated with mercury dust known under the trade name of Ceresan.

"The most striking result obtained was the reduction in the sore-shin disease. Over 60 per cent of the plants grown from untreated seed had sore-shin, while only 16 per cent of those grown from treated seed were so affected, and then very slightly.

"On 115 farms scattered throughout South Carolina, treated seed produced 16.7 per cent more bolls than untreated, which means an extra 205 pounds of seed cotton per acre." (This statement bears the date December, 1937. -- Editor)

### Cotton Seed Treatment Experiments in Georgia

The data given here are from the Annual Report of the Georgia Experiment Station, Experiment, Georgia, for the year 1936-37.

Cotton Seed Treatment. This year seed treatment tests were run on a small scale with one lot of cotton seed showing high (92 per cent) germination. Four lots of 2,000 seed each were planted in four walled beds, of the same soil type, in which cotton had been grown annually during the past seven years. Lot one was dusted, two days before planting, with Ceresan at the rate of 4 ounces per bushel, lot two with New Improved Ceresan at one ounce per bushel, lot three delinted and soaked 30 minutes in 1-1000 mercuric chloride solution, then dried, and lot four untreated check. The two dusted lots were held 48 hours in closed jars before planting. Plants produced, counted at chopping time, were 857, 617, 870, and 614, respectively. Under the conditions prevailing this year delinted seed gave highest germination but this has not been usually true in our tests. Ceresan again gave significant increase in germination over the untreated check. The new Improved Ceresan retarded germination noticeably.

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This is the twelfth year of the tests with dust treatment of cotton seed. With seed lots of varying viability, we have always obtained significant increases in germination from dusting the seed; and feel that with the development of suitable machines for dusting cotton seed this treatment might profitably be adopted as a general practice by cotton growers.

Oat Smut Control. A five-year study of the efficiency of various chemical treatments of seed oats for control of smut under Georgia conditions was completed last year and the results published in Circular 110. Twenty-four treatments were tried, and several of these gave satisfactory control of smut. Dusting the seed with New Improved Ceresan was considered the most efficient and satisfactory treatment tried. During the three years in which this treatment was used it gave perfect control of smut and a 3.3 per cent increase in stand of oats. Liquid formaldehyde, applied by several different methods, gave good control of smut but required careful handling to avoid serious reduction of germination.

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"Ceresan" is a trade mark registered in the U. S. Patent Office by Bayer-Semesan Company, Wilmington, Del.

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# THE CONTROL OF CERTAIN CANNING TOMATO DISEASES IN PENNSYLVANIA INCLUDES A NUMBER OF TREATMENTS

EDITOR'S NOTE:- The data presented here are from a paper delivered before the Pennsylvania Canners' Association at York, Pa., December 8, 1937, and reprinted from The Canner, Chicago, Ill. The authors are Dr. R. S. Kirby and Dr. O. D. Burke, Agricultural Extension, Pennsylvania State College.

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Tomato disease problems should be of vital interest to canners, since both supply and quality are closely tied up with tomato disease prevention. Field surveys and estimates during the past several years indicate that in average years losses from diseases are about one-quarter of the crop. In severe disease years such as 1937 the loss may be as high as one-half the crop.

Tomato diseases, like most plant diseases, are closely related to weather conditions during the growing season. Abnormal rainfall from June 1 to August 1, 1937 (1.87 inches above normal in the state), especially heavy rainfall in the canning sections, as for example 9.66 inches above normal in Lancaster County where normally only 15.8 inches falls, resulted in the heaviest loss from tomato diseases on record in this state.

## Principal Diseases

Of the numerous diseases attacking field grown tomatoes in Pennsylvania, nearly two-thirds of the loss is caused by Alternaria collar-rot and leafspot. Septoria blight is responsible for the second heaviest loss, varying from one to four per cent. Mosaic ranks third in importance followed by Fusarium wilt and bacterial canker. Numerous other diseases such as Phytophthora blight, Anthracnose and Buckeye rot occur locally each year.

With the increasing importance of tomatoes as a canning crop and their more widespread and frequent planting on the same soil, diseases are becoming more serious. Intensive disease control work in cooperation with a Pennsylvania canner was started in 1934. At that time Bacterial canker and Alternaria collar-rot and leaf-spot were serious diseases. A program of tomato disease control was established with one canner. It consisted of seed fermentation followed by corrosive sublimate treatment, soil sterilization for the seedbeds and spraying the seed and transplant beds. Four years' work with this system resulted in the elimination of primary collar-rot in all fields planted with plants produced under this system. In the same locality, plants produced without these disease prevention precautions during 1934 had an average of nearly 50 per cent collar-rot.

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State and federal inspectors graded tomatoes from 80 growers for this canning concern and found that those growers who grew crops from plants under the recommended system had 26 per cent more No. 1 tomatoes than those who grew crops from plants not disease-free at planting time. At the same time yields in plot tests showed that plants produced under the disease control system, out-yielded other types of plants by at least 20 per cent.

In the severe disease season of 1937 a field survey, made early in July, showed the further importance of disease control practices. Fields from plants produced by four large plant growers showed that when disease control practices were not completely followed, an average of 22.5 per cent of the plants in the field had primary collar-rot. In fields of plants from two other sources where disease control practices were followed under the supervision of plant pathologists it was found that one source had only 1 per cent collar-rot while the other had none.

## Soil Sterilization

During 1937, plot work at the Pennsylvania State College was conducted to obtain information on the value of soil sterilization and spraying. The seed of the Marglobe variety used in these trials was treated with corrosive sublimate, followed by red oxide. It was planted in cold frames in which the soil was untreated; in another case it was steamed with the steam pan method for 20 minutes; and in the third, steamed with a solution containing one-half pint formaldehyde per pan. To determine the comparative value of various copper compounds in spraying tomatoes, unsprayed and sprayed rows alternated across each bed. At transplanting time, plants in each five foot six inch row were cut off level with the ground and weighed in grams. The results were as noted in Table I.

This test was on soil which had not grown tomatoes for a number of years. It will be noted that steam sterilization slightly increased the average yield over the untreated in addition to eliminating the weed problem; also when formaldehyde was added to the steam the increase in yield was almost 50 per cent over either steamed or untreated plots.

The value of spraying in the seed-bed is clearly brought out when one considers that all seedlings that were sprayed weighed more per row than those that were unsprayed. In addition, it will be noted that Bordeaux mixture sprayed plants yielded less than either those sprayed with red oxide or the copper-oxi-chloride between which no real difference was apparent.

To determine whether or not field spraying influenced yields, 1/170 acre plots were set with plants from rows receiving the same spray in the seed-bed as they were to receive in the field. In the field nine spray applications were made beween July 1 and August 31. Yield data were taken and computed as tons of tomatoes per acre.

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It is important to note that under 1937 conditions, Alternaria and Septoria leaf spots were serious and that plants sprayed with Bordeaux mixture yielded almost double the unsprayed ones; that those sprayed with red oxide yielded nearly two and one-half times the unsprayed; and those sprayed with copper-oxi-chloride yielded approximately three times as much as unsprayed plants.

These data indicate that seedbed spraying should be adopted as a regular practice and that under severe disease conditions, field spraying with some of the newer types of copper sprays may be a profitable practice.

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TABLE I - TOMATO SEED-BED RELATION OF SOIL TREATMENT AND SPRAYING GROWTH

| | ----------Four Sprays Applied in Seed-bed---------- | | | | |
|---|---|---|---|---|---|
| Soil Treatment | Unsprayed (Grams) | Red Oxide 2 lbs. mayonnaise to 100 gals. (Grams) | Copper-oxi chloride 4 lbs. to 100 gals. (Grams) | Boreaux 4-4-50 (Grams) | Average (Grams) |
| Steam with high pressure Jenny 20 minutes | 212 | 236.6 | 244 | 208 | 225.1 |
| Steamed as above plus formaldehyde in water 1/2 pint per pan | 258 | 385 | 356 | 323 | 330.5 |
| No treatment | 189 | 227 | 254 | 224 | 223.5 |
| Averages | 218.3 | 282 | 284.6 | 251.6 | ----- |

TABLE II - AVERAGE YIELDS IN TONS PER ACRE WHEN COPPER MATERIALS ARE COMPARED IN SPRAYING TOMATOES, 1937

| Unsprayed | Red Oxide 2 lbs. to 100 gals. Mayonnaise added | Copper-oxi-chloride 4 lbs. to 100 gals. | Bordeaux 4-4-50 |
|---|---|---|---|
| 7.536 | 18.891 | 22.036 | 14.556 |

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# THE BLACK WHEAT-STEM SAWFLY IS A SERIOUS PEST IN OHIO COVERING MORE THAN ONE-FOURTH OF STATE

EDITOR'S NOTE:- The black wheat-stem sawfly is a new introduction of considerable economic importance. Facts on the spread of the insect in Ohio, given here, are from the Ohio Agricultural Experiment Station Bimonthly Bulletin, Vol. XXII, No. 188. *Figure 1 omitted.

By J. S. Houser, Chief,
Department of Entomology,
Ohio Agricultural Experiment Station,
Wooster, Ohio.

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Particular attention was given Ohio's new wheat pest, the black wheatstem sawfly, during the course of the annual wheat field survey.

It will be recalled that this insect was discovered in Ohio in 1934. Since that time the spread westward has progressed until at present the sawfly is known to occupy an area slightly more than one-fourth that of the entire State.

The outstanding revelation of the survey this year is the amount of new territory added to that formerly known to be occupied. Reference to the accompanying illustration, Figure 1,* will demonstrate this point.

The numbers in each county indicate the average percentage infestation of the fields examined. Usually, a random sample of 50 straws from each of 10 fields in each county was used for this survey.

If the infestation records for 1937 are compared with those of 1936 of the counties comprising the more heavily infested area, it will be observed that a decrease in percentage infestation is indicated for this season. It is possible that this is somewhat misleading when considered from the standpoint of the total number of insects present within any given area. As a general rule, the number of wheat straws per acre is much larger this year than last, which may account for the larger percentage of the crop which escaped attack.

A peculiarity in the insect's behavior occurred this year 1937 in that progress of the larvae downward toward the base of the plant was delayed until later than usual and that in some fields some of the straws were cut off two or three joints above the base instead of near the soil surface, the usual place. A possible explanation for this digression from normal is that on the average the wheat was much taller than last year.

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The percentage of fallen straw was not as large this year as it has been some seasons. On other occasions also it has been observed that thick stands of wheat are less likely to lodge from sawfly attack than are thin stands. This year a larger number of straws than usual were not completely severed by the insect even when harvest was delayed until the dead-ripe stage. This fact, together with the failure of the crop to lodge in the characteristic manner when the sawfly is abundant, created the false impression in the minds of some growers that the insect was not present. Some fields were observed which had very little fallen straw but which had as much as 70 per cent of the straws infested.

## Effect on Harvesting

The question has been raised whether the presence of this new wheat pest in Ohio wheat fields might not influence adversely the adoption of the combine as a harvesting device. As was indicated in last year's report on this insect, some of the farmers in the more heavily infested area have modified their harvesting practice to the extent that they are cutting their wheat, when possible, slightly in advance of the dead-ripe stage. It is necessary, of course, to wait until the straw is ripe and the grain hard before the combine can be used.

In brief, it may be stated that according to our present knowledge of the sawfly problem, possible losses may be reduced by following those farm practices which produce thick, vigorous stands and by harvesting the grain slightly in advance of the dead-ripe stage.

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## SWEET POTATO SPROUT TREATMENT FOR CONTROL OF STEM ROT SHOWN BY TESTS IN MARYLAND TO LARGELY INCREASE YIELDS

EDITOR'S NOTE:- The excerpts below are from Extension Circular 122; University of Maryland, Extension Service, College Park, Maryland; entitled "Sweet Potato Certification" by R. A. Jehle, August, 1937. It is suggested that a copy of this circular be obtained from the University.

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Sprout Treatment for Control of Stem Rot. Treatment of the roots of sweet potato sprouts with organic mercury compounds has been tested by the University of Maryland. The compound which has given most favorable results is 12% nitrophenol mercury combined with 2% chlorophenol mercury. (New Improved Semesan Bel). No apparent injury to the plants has resulted and in almost every instance the percentage of plants affected with stem rot was greatly reduced and the yield was increased by the treatment. The material was used at the rate of 1 pound to 7½ gallons of water.

Six tests were conducted in 1933 and five in 1934*. (*These tests were conducted in cooperation with J. P. Brown, County Agent, Salisbury, Maryland.) In the plot planted from untreated sprouts, 9.3% of the plants had stem rot in 1933 and 6.55% had stem rot in 1934. In the plot planted from treated sprouts, 2.2% had stem rot in 1933 and 0.74% had stem rot in 1934. Yields were obtained in three of the tests in 1933 and from three in 1934. The average yield from the plots planted from untreated plants in 1933 was 206 bushels per acre and in 1934, 75 bushels per acre. The average yield from the plots planted from treated plants in 1933 was 302 bushels per acre and 115 bushels per acre in 1934. Thus, the plots planted from treated plants yielded approximately one-third more than the plots planted from untreated plants. The manufacturers of the organic mercury dust now recommend a dilution of one pound to ten gallons, based upon the results of later tests.

The 12% nitrophenol mercury and 2% chlorophenol mercury should be diluted at the rate of one pound of the chemical to ten gallons of water. (One pint -- dry measure -- holds one pound of the chemical). Measure the water and weigh or measure the dust. Do not guess and do not make the solution any stronger. Wash all soil from the sprouts before treating them by dipping them in a pail of water. Dip the lower end of the sprouts into the solution to the ground line. Do not wet the leaves with the solution. To avoid wetting the leaves, dip only a handful of sprouts at a time.

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Do not treat the sprouts more than a few hours before they are to be set out in the field. If the treated sprouts must be held for longer periods or overnight, they should be spread out to dry. If treated plants are kept packed closely for more than two or three hours when they are still wet, they are likely to be injured.

Do not use old solutions of organic mercury compounds. They may be kept safely one or two days but if kept longer, injury to plants is likely to result from their use.

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New Improved "Semesan Bel" Seed Disinfectant - "Semesan Bel" is a trade-mark registered in the U. S. Patent Office by the Bayer-Semesan Company, Wilmington, Del.

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# DAMS USED IN NEBRASKA TO DIVERT FLOW OF STREAMS AND SATURATE SOIL TO PERMIT PROPAGATION BLASTING

EDITOR'S NOTE:- Stream correction by blasting, formerly seldom undertaken except at times when the soil was very wet, can now be practiced at almost any time, due to the development of a simple method for saturating the ground, which is described here.

By L. F. Livingston, Manager,
Agricultural Extension Section,
E. I. du Pont de Nemours & Co.,
Wilmington, Delaware.

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Blasting to straighten the channel of a stream offers little difficulty to the experienced user of explosives, provided the work is done when there is sufficient water in the ground to permit shooting by propagation. Dry soil can be successfully blasted, it is true, but more time, labor and explosive are required, and each hole must be primed with a blasting cap.

Thousands of stream beds should be straightened to stop erosion and to protect crop lands from flooding due to the overflowing of streams which become clogged with debris at bends.

Great numbers of crooked channels are to be found in sections where the streams are dry or nearly so except at the time of the heavy spring rains. Lack of attention to stream correction in such localities has resulted largely from the cost and trouble of digging in dry ground and because of the number of curves within relatively short distances, in many cases.

## Saturating Soil Permits Propagation Blasting

In Nebraska, agricultural engineers have developed a method of saturating soil so that meandering streams may be corrected easily by propagation blasting with dynamite.

The procedure is both simple and effective. A straight line that will eliminate the curve in the stream's course is staked. Then, two back-to-back furrows are plowed on the centerline. The second step is the building of a dam to raise the water of the stream and divert it through the plowed area. By this means, the soil through which the cut-off is to be blasted is, after a time, saturated with water. Blasting is then done in the usual way for shooting a ditch in wet soil; that is, by propagation.

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A permanent dam is necessary to prevent water from flowing through the old crooked bed of the stream, but such a barrier can be erected without any great cost. Silt deposited back of the dam by the flow of the stream will reinforce it in time.

## Gullying Should be Prevented Where It May Occur

In some instances, it may be advisable to plant the abandoned section of a stream bed to prevent gullying. This may be done in any way shown by experience to be effective.

If there are several cut-offs to be made, the one farthest up stream should be shot first as the scouring action of the water passing through the newly blasted cut will carry a considerable quantity of soil which will be deposited usually in the bends below. This has a tendency to fill up those bends which are to be taken out later. The soil thus deposited will also enable planting to better take root.

The practice of saturating soil, as carried on in Nebraska, makes possible blasting by propagation at any period of the year when the ground is not frozen, and there is sufficient water in a stream to divert in the manner described. Because of this, farmers can take advantage of times of slack in farm work to correct bends in streams on their lands.

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## "URAMON" IS NEW TRADE NAME FOR FERTILIZER COMPOUND

The fertilizer compound heretofore known as "Agramon" will in the future be sold under the trade name of "Uramon." Announcement of "Agramon" was made last November. There is no change in the composition of the product.

As constituted "Uramon" contains 42 per cent urea nitrogen and is semi-granular. Also, it has an equivalent acidity of 36 pounds of calcium carbonate per unit of nitrogen or 75.6 pounds of calcium carbonate per 100 pounds.

It is peculiarly adapted for use in mixed fertilizers where the superphosphate is thoroughly neutralized by ammoniation or by the use of dolomitic limestone or other alkaline materials. Also, it is especially advantageous in the formulation of high nitrogen grades and double strength mixtures, as well as being used as a source of nitrogen in special top dressing mixtures containing potash and phosphoric acid. Another of its important uses is direct application in orchards and citrus groves.

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## INFORMATION FOR READY REFERENCE ON FERTILIZER MATERIALS

The Ammonia Department of E. I. du Pont de Nemours & Co., Wilmington, Delaware, has prepared a handy chart which shows at a glance the nitrogen content and equivalent acidity of fertilizer materials, and gives a method for the calculation of the equivalent acidity of fertilizers. A copy of this chart will be furnished on request.

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## GARDEN SEED TREATMENT IN STATE OF WASHINGTON

The excerpts which follow are from Circular No. 91, March, 1938, issued by the State College of Washington, Western Washington Experiment Station, Puyallup, Washington.

For treatment of general garden seeds, "Semesan" can be highly recommended. Directions for its use with seeds of various vegetables will be found in the package with the chemical. For large-scale planting of peas, either "Semesan" or red copper oxide can be recommended. The cost of treatment is somewhat less with red copper than with "Semesan."

The manufacturers of "Semesan" have another chemical, 2% "Ceresan," that they claim is as effective for pea seed treatment. This chemical has not been tested in western Washington. "Semesan Jr." is a special form of "Semesan" for treating corn. It is cheaper than regular "Semesan."

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"Semesan," "Semesan Jr." and "Ceresan" Seed Disinfectants are trade-marks registered in the U. S. Patent Office by the Bayer-Semesan Company, Wilmington, Delaware.

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